BULLETIN

OF THE

MADRAS GOVERNMENT MUSEUM

EDITED BY THE SUPERINTENDENT

CATALOGUE OF THE MUSICAL INSTRUMENTS EXHIBITED IN THE GOVERNMENT MUSEUM MADRAS

BY

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681

NEW SERIES—*General Section, Vol. II, Part 3*

MADRAS
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS
1931

PRICE, 2 *rupees* 8 *annas*

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(Published—April 1931)

FOREWORD

At the request of the Superintendent, Madras Government Museum, two years back, I began re-arranging the Section on Musical Instruments in the Ethnological Gallery. At the conclusion of the work, the Superintendent suggested to me the idea of preparing a descriptive catalogue for the section and this book is the outcome of that suggestion. I am deeply indebted to him for the valuable assistance he gave me at all times. I have also derived much help from Diwan Bahadur K. Rangachariar, the former Ethnological Assistant and Mr. A. Aiyappan, the present Ethnological Assistant.

In the preparation of this book, I have consulted Captain Day's "Music and Musical Instruments of Southern India and the Deccan", Dr. Meerwarth's "Musical Instruments in the Calcutta Museum", Rev. Popley's "Music of India", Atiya Begum Fyzee Rahamin's "Music of India" and Ethel Rosenthal's "Indian Music and Its Instruments."

Sangeetashrama,
CHETPUT, MADRAS,
7th October 1930.

P. SAMBAMOORTHY.

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INDIAN MUSICAL INSTRUMENTS.

I.—INTRODUCTION.

India is one of the few countries in the world presenting a rich variety of musical instruments. The varieties that have been evolved in the course of her long history are thoroughly representative of the stringed, wind and percussion groups. There are at least *five hundred* of them, each with a distinct name, shape, construction, technique and quality of tone. The instruments of the key-board type, however, did not find favour with the musical genius of the country and they fell into disuse long ago. It was not possible by any amount of skill on the part of the performer to produce the gamakas (the graces and embellishments) with the key-board instruments, which gave only notes of fixed pitch. The gamakas are the life and soul of Indian music and in the words of a classic* writer "Music without gamaka is like a moonless night, a river without water and a creeper without flowers." The practical disappearance of the Swaramandala and the harp† is to be attributed to the same cause. These two instruments were played on open strings and there was no provision to stop them, which is a necessary condition for the production of gamakas. The *Saptaghantika* and the *Nallatarang* are the two modern survivals of the key-board type of instruments in India.

The materials of which the instruments are made, are for the most part those that are easily procurable in the country. Large gourds, bamboo canes, reeds, jackwood, black-wood, earthenware and the skin of calf, sheep, buffalo and monitor (varanus) lizard are employed. The gourds are trained in their growth to the required shape. Silver, bronze, brass, copper and iron are amongst the materials used in the manufacture of musical instruments.

One characteristic feature of Indian musical instruments is that in both the stringed and the wind group, the fingers stop the strings and the finger-holes directly and there is no intervening mechanism like a key. The great advantage of this system is that the playing of the most subtle gamakas becomes easy.‡ Complexities in the construction of the instruments are also avoided.

Every instrument has its own technique in playing. Ample provision is made for the accurate tuning of the several instruments. The concert-drum in Indian music plays a far more important part than in European music. It is played continuously and it also

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* Somanatha in his "Raga Vibodha."

† There are three Buddhist sculptures from Amaravati (belonging to the 2nd century A.D.) preserved in the Archæological Gallery of the Madras Museum in which the harp figures. The best is a fragment of the left hand side of a medallion showing several women, one of whom is playing the harp. In the renunciation scene above the most complete of the Chaitya slabs (Burgess, The Buddhist Stupas of Amaravati and Jaggayyapeta, pl. I.) a similar harp is resting against one of the women sleeping in the foreground. In the sculpture on the coping of the railing showing the Malla women celebrating the division of the Buddha's relics (Ibid. pl. XXV, fig. 2) one of the women is holding a harp.

‡ In the gotuvadyam a piece of wood is used to stop the strings, but as it is held firmly by the left hand fingers effective direct manipulation takes place so that it is as good as the fingers themselves stopping the strings.

closely accompanies the singer. The pitch of the concert-drum is invariably the same as the key-note of the singer or the principal performer.

II.—CLASSIFICATION.

Musical instruments are classified into—

(1) Stringed instruments.

(2) Wind instruments.

(3) Percussion instruments.

Stringed instruments known as Tata (तत)* vadyas in Sanskrit (நரம்புக்கருவிகள் in Tamil) are of three kinds :—

(*a*) Bowed varieties: Violin, Sārangi, Dilruba and Bālasaraswati.

(*b*) Plectral varieties, where the strings are plucked by the fingers or by a plectrum of wire or horn: vīṇa, gōṭuvādyam, sitar, swarabat, tambura and ektār.

(*c*) Those struck with a hammer or a pair of sticks either directly or mechanically: Swaramandala, gettu vadyam, qanun and pianoforte.

The bowed and the plectral varieties, where the strings are stopped, admit of two varieties each :—

(1) Those with a plain finger-board: Violin, sārangi, sarode and gōṭuvādyam.

(2) Those with frets: vina, sitar, dilruba and bālasaraswati.

N.B.—The Swaramandala, harp, tambura, ektar, qanun and the gettu vadyam are played on open strings

Wind instruments known as Sushira (सुषिर) vādyas in Sanskrit (காற்று வாத்தியங்கள் அல்லது துளைகருவிகள் in Tamil) are of two kinds :—

(1) Where the wind is supplied by a mechanical contrivance—commonly a bellows: organ and the harmonium.

(2) Where the wind is supplied by the breath of the performer: conch and musical pipes.

Gaurikālam, ekkālam, tiruchinnam, tārai, tutāri, bhūri, kombu and reed dulcimer are instances of musical pipes without finger-holes. While nāgaswaram, flute, mukhavīṇa and maguḍi are instances of musical pipes with finger-holes.

In some musical pipes, wind is blown through vibrating reeds or tongues or mouth-pieces: as in nāgaswaram, ottu, mukhavīṇa and maguḍi.

In others, wind is blown through an orifice in the wall of the instrument itself, as in the flute.

Instruments of percussion which are mostly time-keeping instruments are of two kinds :—

(1) Skin-covered instruments called avanaddha (अवनद्ध) vādyas in sanskrit—தோல் கருவிகள் in Tamil.

(2) Ghana (घन) vādyas—solid and weighty instruments of metal or wood—cymbals and castanets.

* Vadya = musical instrument.

The skin in the avanaddha vādyas may be stretched over an open circular frame of wood or metal as in kanjira, tambattam, chakra vādya, sūryapirai and chandrapirai; or, over a hollow body enclosing air inside as in damārum, tabla, bāya, nagāra, kinikittu, karaṇai and vira malahāri; or, the skin may be stretched over the two faces of a hollow shell open at both ends as in Uḍal, Tavil, Uḍukkai and Mridangam.

There is a huge drum called Pānchamukham in the Tiruvārur Temple in Tanjore District which has five faces.

Ghana vadyas are either of metal or wood. Cymbals, jhanj, brahmatalam, sēmakkalam and tālam are instances of the former class; and chipla, kartāl and other wooden castanets are examples of the latter class.

From the point of *utility*, musical instruments might be classified into those used in—

(1) *Concert music*, which again fall under three classes—

(*a*) *Śruti vādyas*, i.e., used for sounding the drone or the key-note, e.g., tambura, ottu and sruti upanga.

(*b*) *Laya vādyas*, i.e., used for keeping time, e.g., mridangam, ghatam, kanjira and gettu-vādyam.

(*c*) *Sangita vādyas*, proper, i.e., used for playing music, e.g., vīṇa, violin, sitar flute, nāgaswaram and jalatarangam.

(2) *Temple music*, e.g., horns and trumpets, mukhaviṇa, conch, bhūri, uḍal, uḍukkai and pambai.

(3) *Martial music*, e.g., dundubhi, bhēri, parai and tārai.

(4) *Folk music*, e.g., ēktar, tuntina, nedunkuzhal, tutari, kombu, pot-drum, tamuku and crude cymbals of iron.

III.—EVOLUTION.

Of the stringed, wind and percussion groups, the last named has the longest pedigree. We come across wind and stringed instruments at slightly later stages of human history. Wind instruments came into existence soon after the earlier types of percussion instruments; likewise stringed instruments came into existence soon after the earlier types of wind instruments. The principle underlying each instrument was suggested to man by nature itself in most cases.

Percussion group.—The following instruments roughly illustrate the main stages of evolution in this group:—

(1) Stone-gongs and rude wooden castanets.

(2) Metallic cymbals and gongs.

(3) Skin stretched over a simple circular frame: Tambattam and Kanjira.

(4) Skin stretched over a hollow body enclosing air inside: Pot-drums and wooden conical drums.

(5) Skin stretched over the two faces of a hollow cylindrical body: uḍal, ḍōlak, tavil and uḍukkai.

(6) Double-faced drums—one of the faces capable of being tuned: Mridangam and tabla.

Wind-instruments group.—The following instruments roughly illustrate the main stages of evolution in this group :—

(1) Horns and pipes: Kombu.

(2) Pipes with longer sound-columns to strengthen the sound: Bent-horns and horns with series of windings.

(3) Horns with tube-like devices: Ekkālam and the telescope trumpet.

(4) Reed dulcimer and the gourd flute: in the latter reeds of different lengths were inserted into a gourd, to give a scale of sounds.

(5) Musical pipes with few finger-holes as the Murali and Nedunkuzhal.

(6) The concert flute.

(7) Pipes with mouth-pieces and reeds or tongues: Nāgaswaram, Mukhavīṇa.

(8) Key-board varieties: Nallatarang.

Stringed instruments group.—The following instruments roughly illustrate the main stages of evolution in this group :—

(1) Bow-string. Reference to the twanging of the bow-string is to be found in the epics of all nations.

(2) Improved bow-string, with strings of different lengths and tuning pegs for tightening or slackening the strings.

(3) Harp and the Swaramaṇḍala.

(4) Ektar and Tuntina with simple resonators.

(5) Tambura.

All the instruments up till this stage were played on open strings. It was found to be a laborious process to be twanging the various strings for the various notes. And serious attempts were made to play the different notes on the same string and this led to the invention of frets.

(6) Kinnari. } Gourd resonators.
(7) Rudra Vīna. }

(8) Vina with movable frets.

(9) The modern South Indian Vīṇa with 24 fixed frets and a wooden resonator.

(10) Mahānātaka Vīṇa (Gotuvādyam).

The bowed varieties came into existence shortly after the plectral varieties.

Instruments of percussion of definite sonorousness for playing the different notes like the Jalatarangam (see Plate VIII, fig. 1) and Saptaghantika appear last. The Saptaghantika consists of bells of various sizes and are struck by small hammers, connected to a key-board.

IV.—PLACE OF MUSIC IN INDIAN LIFE.

In India, music is given an important place in the scheme of life of the nation. There is not a single festival or ceremony without some form of music or other. Every Indian

prince has in his court, talented musicians who are paid handsome salaries. The Emperor Akbar had in his court the gifted musicians Tan Sen and Nayuk Gopal. We learn from the **Ain-i-Akbari* that the Naubat† was held in great esteem in the time of the Mogul Emperors and that Emperor Akbar was even a performer. The performances of the Naubat occupied a prominent place in the daily palace routine. Shah Jehan rewarded a musician with a fee of his weight in gold. Yoga Narendra Malla of Palam inscribed in his coins the title " Sangītārnava Pāraga"—skilled in the sea of music. In the Tamil books Purāṇanūru and Pattupāṭṭu the drum is referred to as occupying a position of very great honour. Musical inscriptions like those at Kudumiyamalai and Tirumayam and the representation of musical instruments in the Amarāvati and Sanchi sculptures and in the sculptures existing upon various old cave-temples and ancient Buddhist topes and stupas in different parts of India furnish ample proofs of the esteem in which the art was held and the dignity which it enjoyed.

Besides the instruments used in martial music, Royal dignitaries had in their establishments silver-horns and tārai and tamuku of bell-metal as befitting their rank.

The heads of mutts and other spiritual gurus also according to their rank, had in their establishment performers of musical instruments.

Next to the State, the temple has given great prominence to music in various ways. The peria mēlam ‡ (Nāgaswaram band) is to be found in every temple in Southern India, whether rich or poor. The Nāgaswaram music is one of the essential items in all processions and festivals. No Hindu marriage is celebrated without it. On the occasion of the Dipāvali and Pongal festivals the nāgaswaram players go to the houses of their patrons and after playing a tune or two, receive their customary presents. Besides the nāgaswaram party there are in the temple establishments performers of various kinds of wind and percussion instruments, who perform before the deity in temple processions on the occasion of the annual festivals. The finely decorated elephant, camel and the horse carry special drums on their backs in front of the deity. In some big shrines, on the occasion of certain important services, the *sarvavādyam* (literally all instruments) is played. The sarvavādyam consists of 32 different varieties of wind and percussion instruments.

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* See Blochmann's translation, Vol. I.

† *Naubat* (literally nine performers) is an old institution of Indian music found in the establishments of Hindu and Mahomedan chieftains and zamindars The players sit in balconies over the gateways of cities, palaces, mansions or in other elevated places and perform at stated hours of the day and night The place where they sit and perform is called the *Naubatkhana.* The music when heard at a distance has a charm all its own. The naubat was also stationed over the gateways of mausoleums and tombs of royalty as in the Gombuz or the mausoleum of Hyder Ali, Tippu Sultan and his mother in Serangapatam, in Mysore.

‡ *Melam* —The Indian band consisting of performers of wind instruments, drums and cymbals is called as *melam.* The nāgaswaram band (see Page 15) known also as the Tanjore band is called the peria melam (big melam). Contrasted with this is the chinna melam (small melam) or the *nautch party*, which consists of the dancing woman and four male musicians at the back, playing the flute (now substituted by the western clarionet) sruti upanga (bag-pipe drone) mridangam and talam (cymbals) respectively. The dancing woman wears on her legs ankle-bells (gejjai) and silambu both of which give a sweet tinkling sound as she sways to and fro.

In addition to this outdoor music, many temples have in their establishments regular paid musicians—vocalists and instrumentalists (vīna, violin, tambura and mridangam players) and bhajana parties. These musicians perform on all festive occasions and are entitled to the temple honours and privileges. Some of them are given inams of land in lieu of their services. In Saivite temples there are the *oduvārs* who sing Tēvāra hymns in the daily services and enjoy the same status as the musicians mentioned above.

Musical instruments of the primitive type are seen in the hands of wandering mendicants, dāsaris, āṇḍis, jugglers, ballad-singers, paṇḍārams and gipsies.

V.—ARRANGEMENT IN THE GALLERY.

In the musical instruments gallery of the Ethnological Section of the Madras Museum there are about 70 specimens representing the prominent South Indian varieties. This includes a good collection of tribal instruments, particularly those belonging to the West Coast. With the exception of a few unimportant ones all the specimens have been photographed and shown in the plates. A detailed description of the instruments in the plates is given in Section VI. For the sake of the casual visitor however a list of the instruments exhibited in each case at the time of the preparation of this catalogue (1930) is given below. The roman figure against each instrument shows the number of the plate in which it is seen and the arabic numeral denotes the number of the specimen in the plate. Where there are no figures, it is to be presumed that such instruments have not been photographed and reproduced in the plates.

Case I—

1. Tambura with a gourd shell.
2. Tambura with a wooden shell and rest II, 3.
3. Tambura (Tanjore model) II, 1.
4. Ektār II, 4.

Case II—

1. Vīna (Tanjore model) I, 1.
2. Big Sitār I, 4.
3. Small Sitār I, 5.

Case III—

1. Gōtuvādyam I, 2.
2. Violin.
3. Sārangi II, 6.
4. Tuntina II, 2.

Case IV—

1. Kinnari IV, 6.
2. Swarabat I, 3.
3. Bālasaraswati II, 5.

Case V—

1. Nāgaswaram IV, 1.
2. Do. (another variety) IV, 2.
3. Ottu IV, 3.
4. Mukhavīṇa IV, 4.
5. Sanāi IV, 5.
6. Do. (rosewood).
7. Maguḍi III, 5.
8. Shepherd's flute III, 2.
9. Concert flute III, 1.
10. Neḍunguzhal III, 4.
11. Reed Dulcimer III, 3.
12. Conch VI, 7.

Case VI—

1. Kombu III, 9.
2. S-shaped horns III, 10, 11, 12.
3. Tiruchinnam III, 8.
4. Bhūri III, 6.
5. Ekkālam III, 7.

Case VII—
1. Mridangam V, 1.
2. Tabla and Bāya V, 2 a and b.
3. Uḍukkai (metal shell) VI, 3.
4. Do. (wooden shell).
5. Davanḍai VI, 4.
6. Pambai VI, 5.
7. Dāsari Tappattai IV, 8.
8. Kanjira V, 5.

Case VIII—
1. Jalatarangam VIII, 1.
2. Gejjai (ankle bells) VIII, 3.
3. Silambu VIII, 2.
4. Pujari Kai Chilamba VIII, 4.
5. Jālra VII, 1.
6. Tālam VII, 3.
7. Brahma tālam VII, 2.
8. Sēmakkalam IV, 7.
9. Chipla VII, 4.
10. Moursing VIII, 6.

Case IX—
1. Pulluvan Kuḍam IX, 2.
2. Ghaṭam VIII, 5.

Case IX—cont.
3. Dolak V, 3.
4. Vīṇa Kunju IX, 4.

Case X—
1. Tavil V, 4.
2. Tambaṭṭam IX, 7.
3. Damārum VI, 3.
4. Kanjira V, 5.

Case XI—
1. Sūryapirai and Chandrapirai VI, 6.
2. Kartāl VII, 5.
3. Villukoṭṭu IX, 3.
4. Cylindrical drum IX, 6. } Kota instruments.
5. Tambattam IX, 7. } Kota instruments.
6. Kombu IX, 5. } Kota instruments.
7. Villaḍi vādyam (on the top of the case) IX, 1.
8. Mounted conch (on the top of the case).

Case XII—
Nagara VI, 1.

VI.—DESCRIPTION.

1. INSTRUMENTS IN GENERAL USE.

A.—STRINGED INSTRUMENTS.

(*a*) *Concert Class.*

1. Vīṇa.
2. Gōtuvādyam.
3. Swarabat.
4. Sitār.
5. Small Sitār.
6. Bālasaraswati.
7. Sārangi.
8. Kinnari.

Vīṇa (*Pl. I, fig.* 1).—The vīṇa is the classical instrument of India. It is the instrument par excellence for rendering Indian music and rightly occupies the first and the most honourable place amongst Indian musical instruments. It is the instrument associated with Saraswati, the Goddess of Learning, and Nārada, the Divine Musician and Sage. Different kinds of vīṇas are mentioned in the old literature on music and all of them practically represent the different stages of evolution of the instrument. The

specimen shown in the plate is what is commonly known as the Saraswati Vīṇa. This is the modern South Indian Vīṇa with twenty-four fixed frets, twelve for each octave. This type of vīṇa is only three centuries old and was introduced for the first time by Raghunath Naik of Tanjore, ably assisted by his Prime Minister Govinda Dikshitar. In order to demonstrate practically the scheme of the 72 Melakarta* ragas enunciated by him in his work *Sangita Sudha*, he built this type of vīna. Prior to his time, the number of frets on the vina was less than twenty and the frets were either fixed or movable.

The vīṇa consists of a large pear-shaped bowl called kāi or kuḍam (காய் அல்லது குடம்) in Tamil, hollowed out of a single block of wood. The Tanjore manufacturers use jackwood and the Mysore manufacturers use blackwood for this purpose. The block of wood that is intended for the vīṇa bowl is preserved for a long time and small portions are scooped out at long intervals. The flat top of this bowl is about a foot in diameter. At its centre is the main bridge of wood on the top of which is a plate of bell-metal or silver. Secured to this bridge and the belly is the side bridge which is an arc of metal. The bowl is separated from the stem or daṇḍi (தண்டி) by a projecting ledge of ivory. The stem is of the same wood as the bowl and is hollowed out thin. A flat piece of thin wood covers its entire top. Running along each side of the stem are two ledges made of a wax-like substance and on these ledges are fixed the 24 frets. This waxy material can be softened by gentle heat so that the position of the frets might be changed if necessary. The frets are half-round bars of about ⅙ inch in thickness and are of brass, bronze or silver. The stem leads on to the neck which is curved downwards and its tip is carved into the head of a yāli (யாளி), a weird animal. On the under side of the stem near the neck is fixed a hollow gourd (calabash) which serves both as a rest and a resonator. This gourd is easily detachable and is fastened to a cup or socket of metal by means of a nut and screw. This gourd resonator has a round hole cut out at the bottom.

The vīṇa has seven strings, four main strings intended for playing music and three side strings intended for sounding the drone notes and also for keeping time. At the bowl end, the strings are tied to metallic fastenings called langar (லங்கர்) and these are secured to the attachment. Small metallic rings gliding over these metal fastenings help in accurate tuning The four main strings pass over the bridge and the 24 frets, and are tied to the tuning pegs which are two on each side of the neck. The three side strings pass over the metallic arc (side-bridge) and then over small ivory pegs on the side of the stem and then fastened to the three pegs. In the figure, only one of these three tuning pegs is clearly seen, the other two are visible on the gourd.

* Primary ragas.

The names of the seven strings, their gauge numbers and the notes to which they are tuned are given in the following table:—

* TABLE I.

No.	Name of the string.	The note to which it is tuned.	Gauge No.
1 †	Sārani	Madhya sthāyi shadja or s	31 steel.
2	Panchama	Mandra sthāyi Panchama or p.	29 „
3	Mandaram	Mandra sthāyi shadja or ṣ	26 brass.
4	Anumandaram	Anumandra sthāyi Panchama or p..	24 „
5 ‡	Pakka Sārani	Madhya sthāyi shadja or s	32 steel.
6	Pakka Panchamam	Madhya sthāyi Panchama or p	34 „
7	Hechu Sārani	Tara sthāyi shadja or ṡ	36 „

It should be noted that of the four main strings, the string nearest the player is reckoned as the first string; the next one as the second string and so on.

The vīna is held in a horizontal position across the player's knees and played Sometimes the instrument is held vertical, the bowl resting on the thighs and played. The fore-finger and middle finger of the left-hand are used to stop the four main strings on the frets, while the corresponding fingers of the right-hand twang these strings alternately near the bridge. The finger-nails of the two right-hand fingers, which are grown for the purpose are used to pluck the strings. Amateurs use wire plectra for the purpose. While the main strings are plucked downwards, the three side strings are sounded by the little finger of the right hand, moving upwards.

The tone of the vīna though not rich is sweet and pleasant. Its compass extends over 3½ octaves. All the peculiar graces of Indian music and its capacity for micro-tones find excellent expression on this instrument. *Vainika* is the name given to a vina player. Tanjore, Mysore, Lucknow and Rampur are the chief manufacturing centres for vīna in India. The Tanjore vinas are elaborately ornamented by ivory carvings.

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* *Note on notation.*—The notation used in Indian music is what is known as the *Sa ri ga ma* notation. It is a notation employing scripts and symbols. The seven swaras or notes are called Shadja, Rishabha, Gāndhāra, Madhyama, Panchama, Dhaivata and Nishāda and for *solfa*-ing purposes these notes are shortly called sa, ri, ga, ma, pa, dha, ni. In notation these seven swaras are represented with their initial letters thus:—s r g m p d n.

Sthāyi is the Indian term corresponding to the octave or voice register in western music. All Indian music ranges within three sthāyis which are called as—

(1) Mandra sthāyi or lower octave,
(2) Madhya sthāyi or middle octave,
(3) Tāra sthāyi or higher octave.

The sthāyi below the mandra sthāyi is called as Anumandra sthāyi; and the sthāyi above the tāra sthāyi is called as Ati tāra sthāyi.

Mandra and Tāra sthāyi notes are represented with dots below and above the notes respectively as ṣ ṛ g̣ ṃ (Mandra) and ṡ ṙ ġ ṁ (Tāra). Anumandra and Ati tāra sthāyi notes are represented with two dots below and above the notes respectively as s̤ r̤ g̤ m̤ (Anumandra) and s̈ r̈ g̈ m̈ (Ati tāra).

† 1, 2, 3, 4 are the four main strings.

‡ 5, 6, 7 are the three side-strings sometimes collectively called Pakka sārani.

Gotuvādyam (*Pl. I, fig.* 2).—Called also *Mahānātaka vina.* This is the same as the vina in shape and construction but has no frets. The strings are stopped by a cylindrical wooden piece (shown separately near the top of the bowl in the plate) which is about 2 inches in length and 1 inch in diameter. This piece is held in the left hand and made to glide over the main strings. On account of the absence of frets, notes ranging over more than four octaves could be played on this instrument by placing the wooden piece on the first string at points very near the main bridge. Whereas in the vina, the gamakas are produced by the lateral deflection of the string, that is, by varying its tension, here the gamakas are produced by varying the vibrating length of the string rapidly, and in this respect, it resembles the violin. This instrument is provided with sympathetic strings, which pass over a small bridge beneath the main bridge (see figure) and then over the finger-board beneath the four main strings. The seven small screws to which the seven sympathetic strings are fastened are seen in the illustration fixed in the stem. The seven small pegs seen on the finger-board are the pegs round which the sympathetic strings pass before reaching the screws.

Swarabat (*Pl. I, fig.* 3).—The bucket-shaped resonator and the stem are hollowed out of a piece of wood. There is a parchment belly. Upon this is the bridge over which the six strings pass. There are two circular sound-holes of about an inch in diameter in the belly. The finger-board is narrow with frets of guts to indicate the swarasthānas. The head is carved down like that of a parrot. In the neck are the six tuning pegs. A ledge separates the neck from the stem. The strings are plucked by a horn plectrum shown separately below the stem in the figure. On account of the peculiar construction of the instrument, its range and scope are limited. Although popularly called swarabat, the correct name appears to be *swaragat.*

Sitār (*Pl. I, fig.* 4).—The Sitār (literally *Seh-tar*, which means three wires) is the invention of Amir Khusru, the famous poet and singer attached to the court of Sultan Ala-ud-din Khilji of Delhi (1295-1315). This is the most popular instrument in Northern India and is used for playing musical compositions while the Bīn is used for playing Rāga ālāpana. This is considerably easier to master than the vīna.

The bowl of the sitar is of jackwood or of some other resonant wood. More often the bowl consists of a gourd cut in half in the direction of the core. There is a belly of thin wood fixed upon it. This belly is pierced with sound-holes. The body is connected with the finger-board by means of an ivory ledge. The top of this finger-board which is about three inches in width is slightly convex. 18 to 20 frets of brass or of silver are placed on this finger-board. The frets are elliptical and not straight as in the vīna. Each fret is held in position by a brass spring connecting its two ends by passing round the stem. On account of this spring arrangement, the frets are easily movable and each time there is a change of mode, or *that* * the frets are re-adjusted. The finger-board leads on to the neck which is straight and not curved as in the vīna.

* Thāt = Melakarta raga or primary scale.

There is no gourd-rest near the neck. There is only one bridge in the centre of the belly over which the seven strings pass. All the strings are of metal. After passing over the frets the strings pass through a ledge having notches beyond the frets and then again through a ledge before entering the tuning pegs. These ledges are of ivory. Five tuning pegs are fixed in the neck and two in the stem. Some sitars are provided with sympathetic strings.

The instrument is played with a wire plectrum placed upon the forefinger of the right hand, while the thumb presses the edge of the belly. As the music is played mostly on the last string, this only is stopped with the forefinger and the middle finger of the left hand. The other strings are used as open strings for giving the drone accompaniment. Near the attachment this string passes through a small bead which aids in accurate tuning.

The sitar is also called as *satar*, i.e., *sapta-tār* = seven stringed and also as *Sundari*, the beautiful.

Small sitar (*Pl. I, fig.* 5).—This is another variety of the above instrument. Guts hold the frets (which are flat here) in position here instead of brass springs. The bowl is pearshaped and not somewhat flat as in the above.

Bālasaraswati (*Pl. II, fig.* 5).—This is called as Tāvoos in the north. In shape and construction it is the same as the sitar, but has a peacock-like resonator and the instrument is played with a bow. The frets are movable. The body and the stem are painted like that of the peacock. Underneath the frets there are a number of sympathetic strings. The small ivory pegs round which these sympathetic strings pass before reaching the tuning pegs are seen as white dots on the finger-board in the figure. The small tuning pegs for these sympathetic strings are seen on the side of the stem. There is a parchment belly over which the ivory bridge is placed. The instrument has a soft mellow tone. While the right hand handles the bow (shown below separately in the figure) the forefinger and the middle-finger of the left hand are used to stop the strings on the frets. The instrument is held in an oblique position—the neck resting on the left shoulder and the legs of the peacock resting on the ground and played. The neck of the peacock is easily detachable from the body. The instrument is finely ornamented with ivory. On account of its peacock-like resonator, the instrument is called by various names as Mayūri, Peacock sitar and Peacock fiddle.

Sārangi (*Pl. II, fig.* 6) is the Indian Fiddle. This is more common in Northern India than in the south and is used largely in dance and theatrical music. The instrument consists of a single block of wood hollowed out and has a parchment belly over which is the bridge. There are three thick gut strings to which a fourth string of wire is sometimes added. The pegs for these four main strings are fixed in the neck. Running underneath these main strings are the sympathetic strings whose number vary from eleven to fifteen. The small holes on the finger-board through which these sympathetic strings pass before reaching the tuning pegs are clearly seen in the illustration. The small tuning pegs fixed in the stem are those of the sympathetic strings. The instrument is played by

means of a short bow, shown above the figure. The tone is mellow, delicate and sweet and resembles that of the viola. It is held vertically and played. The most interesting thing about the instrument is that the strings are not stopped on the top with the finger-tips as in the case of most plectral and bowed instruments, but on their *sides* by the *finger nails* of the left hand. All the beautiful graces and gamakas of Indian music can be reproduced with accuracy on the Sārangi. This is one of the prominent instruments used in the North Indian orchestra.

Kinnari (*Pl. IV, fig.* 6).—One of the oldest stringed instruments named after the inventor *Kinnara*, one of the musicians of Heaven. There is hardly a single Sanskrit treatise that does not make mention of this instrument. It is represented on many old Indian sculptures and paintings. The Bible mentions a stringed instrument of much the same name—Kinnor (II Chronicles XX 28).

The finger-board consists of a round stick of blackwood or bamboo and upon this are fixed twelve frets of bone or metal with a resinous substance. The tail-piece of the instrument is sometimes made to represent a kite. Beneath the finger-board are three gourd resonators the middle one being larger than the other two.

There are two or three strings, one of which passes over the frets, the others being drone strings. The tone of the instrument is weak and thin and the range is short.

The Kinnari is in common use among the peasants and lower castes of the Ceded Districts, Mysore and South Kanara. In the tall stone column in front of the Basavangudi Temple in Bangalore, an image of a person playing the Kinnari is seen.

(*b*) *Drone Class.*

1. Tambura.
2. Tuntina.
3. Tambura (another variety).
4. Ektār.

Tambura (*Pl. II, fig.* 1).—This is the classical drone accompaniment of the stringed group. In outer form it resembles the vina minus the frets, gourd resonator and the head-piece (Yāli). The body is semi-globular in shape and is of jack-wood. Cheap tamburas have a gourd body instead of a wooden one. The belly on the top is slightly convex. The body is connected with the stem by means of a ledge. The stem leads on to the neck into which are fixed four tuning pegs—two at right angles to the head and two on the sides. All the four strings are secured directly to the ledge fixed on to the bowl and in the place of the langar of the vina, there are beads threaded upon the strings between the bridge and the attachment which aid in accurate tuning. The bridge on the belly is of wood. Besides this bridge there is a small ivory bridge sliding over a portion of the stem from the neck. Over this bridge the three strings excepting the mandaram string pass. Once the instrument is put in tune, it is possible to easily alter the pitch of these three strings by merely sliding the bridge up or down, in which case the mandaram string is tuned separately. This is a great advantage from the musical standpoint. This sliding bridge is seen on the stem near the neck in the figure. The four strings pass over the main bridge and then over the sliding bridge and then through

holes in a ledge at the junction of the stem and the neck and then enter the pegs. The mandaram string however as already mentioned does not pass over the sliding bridge. The length of the sliding bridge is less than three-fourths of the width of the finger-board so that there is ample space left free for the mandaram string to pass. Tamburas of Tanjore make are invariably provided with the sliding bridge in addition to the main bridge.

The names of the four strings, their gauge numbers and the notes to which they are tuned are given in the following table:—

TABLE II.

No.	Name of the string.	The note to which it is tuned.	Gauge No.
1	Panchamam	Mandrasthāyi Panchama or p. ...	29 steel.
2	Sārani	Madhyasthāyi Shadja or s ...	31 ,,
3	Anusārani	Do. ...	31 ,,
4	Mandaram	Mandrasthāyi Shadja or ṣ ...	26 brass.

It should be noted that the Panchamam string No. 1 is the string farthest away from the performer when the instrument is held in a horizontal position with its body to his right. The gauge numbers given for the strings here as well as for the vina are those commonly met with. There may be slight differences here and there in the thickness of the strings used.

The tambura is usually held upright, the bowl resting on the right thigh and the four strings which are never stopped are gently pulled one after another starting from the Panchamam and ending with the Mandaram. This process is continually repeated. The forefinger of the right hand is used for this purpose. Plectra are never used. Little pieces of silk or wool placed between the strings and the main bridge in a particular position serve to enrich the tonal effect. These threads are called as *Jivāli* (life-givers) and when placed in the correct position, the overtones of each string are heard clearly.

The tambura provides an excellent drone accompaniment to any music, vocal or instrumental. The fifth harmonic note Antara Gandhara or E Natural is clearly heard on the Mandaram string. There are sound holes on the belly of this instrument. The tambura is made both for the rich and for the poor. It is to be seen in the hands of the beggar as well as in the hands of the aristocracy. Tanjore tamburas are beautifully carved and ornamented with ivory. Miraj, Rampur and Lucknow are the other leading centres for the manufacture of Tambura in India.

Tambura (Pl. II, fig. 3) (*another variety*).—This variety of tambura is rather an uncommon specimen. The bowl is of wood and the top is octogonal (eight cornered) in shape. There is a wooden rest near the neck. The neck is carved into a griffin's head bent upwards and not downwards as in the vina.

Tuntina (*Pl. II, fig.* 2).—This and the Ektar No. 4 are the beggars' drones. Tuntina consists of a hollow cylinder of wood or metal covered on the lower side with a parchment. A round stick is fixed on the outer wall of this cylinder. This stick is provided

with a tuning peg at the top. A metallic string, tied to a small stick and made to pass through a copper coin and a hole in the centre of the parchment, is fastened to the peg at the top. The small stick and the copper coin prevent the string from slipping back. The string is tuned to the key-note of the singer's music and the tone is sufficiently loud. The top of the stick (stem) is sometimes decorated with peacock feathers. The instrument is held either in the right or the left hand and the fore-finger is used to pluck the string.

Ektār (*Pl. II, fig.* 4) (Ek=one, tar=string) is the mendicants' drone. A round stick, usually of bamboo of about 4 ft. in length and less than 2 inches in diameter forms the finger-board. One end of this stick is provided with a tuning peg and the other end is passed through a hollow gourd resonator. It has an open string, one end of which is fastened to a nail fixed on to the projection of the stick beyond the resonator. From here the string passes over a crude wooden bridge placed on the gourd and then fastened to the peg at the top. To increase the richness of tone, a silken or woolen thread is placed between the bridge and the string. The instrument is held either in the right-hand or the left-hand, and the fore-finger is used to pluck the string. The instrument is sometimes decorated with peacock feathers, pearls and bright copper coins which are fixed on to the gourd by wax.

B.—Wind Instruments.

(*a*) *Concert Instruments.*

1. Flute.
2. Nāgaswaram.
3. Do. (another variety).
4. Ottu.
5. Mukhavina.
6. Sanāi.

Flute (*Pl. III, fig.* 1).—This is the instrument with which Sri Krishna charmed the Gopis of Brindavan in times of yore. There are several varieties of the flute, each variety having a distinct name. The distinction between these several varieties consists mostly in the distance between the mouth-hole and the finger-holes. *Murali* was the variety used by Sri Krishna.

The flute consists of a simple cylindrical tube of uniform bore closed at one end. The mouth-hole is pierced at a distance of about three-fourths of an inch from the closed end. The number of finger-holes which are of uniform size vary from seven to nine. The mouth-hole and the finger-holes are in a straight line. The mouth-hole is slightly bigger than the finger-hole. The three fingers of the left hand (fore-finger, middle-finger and the ring-finger) and the four fingers of the right hand (excluding the thumb) close the seven finger-holes; the finger-hole nearest the mouth-hole is reckoned as the first hole. The various quarter-tones and micro-tones are produced by the partial opening or closing of the finger-holes. All the delicate graces and subtle shades and gamakas of Indian music can be played with accuracy on this instrument. The system of fingering adopted for the Indian flute is entirely different from the European system.

Flutes might also be made of the following substances:—Ivory, Sandalwood, Ebony, Rakta Chandana (Red variety of sandalwood), iron, bell-metal, silver and gold. But the cheap bamboo has been preferred to all these on account of the excellent quality of its tone and its fine resonating properties.

The range of the flute, played in the Indian method is 2½ octaves, which is the range of an average cultivated human voice. In its monotone quality and in the technique underlying the production of gamakas and jantaswaras, the flute resembles the human voice.

The flute is a concert instrument in India, enjoying the same rank and dignity as the Vina. Vina, Venu (Flute) and Mridangam (Drum) are frequently mentioned as the three great instruments of Indian music in all the old literature.

Nāgaswaram (*Pl. IV, fig.* 1).—This instrument called Nāyanam (நாயனம்) in Tamil is the principal instrument found in the out-door music of Southern India. Its tone is very loud and shrill and could be heard at long distances.

It consists of a wooden conical bore 2 to 2½ feet in length, enlarging downwards. There are seven finger-holes and at the bottom there are five other holes which serve as controllers. Into the metal staple at the top, a reed is introduced. A metallic bell adorns the bottom. Besides spare reeds, an ivory bodkin for adjustment is attached to the instrument. Nāgaswaram playing is a complex technique. The half-tones and quarter-tones here are not produced by the partial closing and opening of the finger-holes as in the flute, but by adjusting the strength of flow of air into the pipe. This is a laborious process and consequently it takes a long time to attain proficiency in this instrument. The system of fingering adopted for the production of the seven swaras being the same as in the flute, its range also is the same as that of the flute—2½ octaves. Since the reed of the nāgaswaram is held within the mouth and played, there is not so much of wastage in the air blown, as in the flute—where the wind is blown directly into the mouth-hole.

There are two varieties of this instrument. One called the *Bāri* (பாரி) type and the other the *Timiri* (திமிரி) type. The former is a slightly bigger one and experts as a rule use only the bāri type.

The Nāgaswaram band or the Tanjore band (Periya mēlam பெரியமேளம் in Tamil) as it is often called consists of:—

(1) The Nāgaswaram player who is the principal performer and the leader of the band.

(2) The ottu or the drone-player.

(3) The tavil-player (drummer).

(4) The time-keeper.

Sometimes, an additional nāgaswaram player and a tavil player may be seen in the band. Occasionally a conch-blower forms an interesting addition to the band and he plays the * jatis (ஜதி) along with the drummer.

* *Jati* is the name given to the tāla-solfa syllables like *taka, tari, kita, naka, jonu, dimi, ta, tin, gina, tom.* These jatis are played on the drums. Drumming is a great art in India and is one of the unique features of Indian music.

Nāgaswaram music is in great demand at weddings, ceremonials, processions and festivals. Expert performers are paid fabulous sums for their performances. Nāgaswaram playing is the monopoly of certain castes in Southern India and elsewhere. They have a continuous tradition behind them. Nāgaswaram performers in the establishments of temples, mutts and Rajahs hold hereditary appointments and in most cases they are given inams of land in lieu of their services.

Pl. IV, fig. 2 shows another variety of the same instrument.

Ottu (*Pl. IV, fig.* 3).—This is the drone accompaniment used in the nāgaswaram band. It resembles the nāgaswaram in shape and construction but is slightly longer. There are four or five holes pierced near the bottom. By closing these holes, wholly or partially with wax, the sruti (key-note) of the instrument is brought up to the desired pitch.

Mukhavina (*Pl. IV, fig.* 4).—This is a miniature nāgaswaram and has nothing to do with the vina as its name is likely to suggest. Its tone is soft and pleasant. A bag-pipe called Sruti Upānga is used as the drone accompaniment to the mukhavina music. Generally the mridangam provides the drum accompaniment; sometimes '*Dhanki*' a peculiar drum is used in the place of the mridangam.

The mukhavina was formerly used in the Chinnamēlam (dance music). It has now been replaced by the western clarionet. On the occasion of the Dipāvali and Pongal festivals, it is usual for the pipers to go to the houses of their patrons playing the soft mukhavina music and receive the customary presents. Its music could be heard during certain services in the Vaishnavite temples of Southern India.

Sanāi (*Pl. IV, fig.* 5).—There are no metal staples and bells here; the cross-section is greater than that of the nāgaswaram. The reed is introduced directly into the hole on the top of the instrument. It has a very shrill tone and is used by Muslims. Its music could be heard in Muslim marriage processions and festivals.

(*b*) *Temple Instruments*.

1 Śankhu (conch).
2. Bhūri.
3. Ekkālam.
4. Tiruchinnam.
5. Kombu.
6-S. shaped horns.

Sankhu (*conch*) (*Pl. VI, fig.* 7).—The most ancient wind instrument known to man. It is held very sacred and reference to it is found in all the literature of India. It is represented in the Amarāvathi and Sanchi Sculptures (3rd cent. B.C.) It is one of the attributes of Sri Vishnu and the conch used by Sri Krishna was called *Pānchajanya*.

The conch is blown through a small hole made in the spiral. Its tone has a distinctive quality of its own and can be heard at a long distance. Used in temples, religious ceremonies and processions and played by the Dāsaris, Pandārams and the Panichavan caste people.

The Sankhu is frequently decorated with a beautiful workmanship at its two ends; and a specimen of this type is shown separately in a small glass case above the tribal

case No. XI in the gallery. The mount on the spiral has a mouth-piece. The mount at the other end has a large floral expansion in shape like the tail of a mythical bird. The picture of a Pandāram playing an ornamented conch and semakkalam, is placed near this case.

Bhūri (*Pl. III, fig.* 6).—This is the curved brass horn used in temples and mutts.

Ekkālam (*Pl. III, fig.* 7).—This is a straight trumpet of brass or copper having four tubes fitting into one another. The instrument is blown at the narrow end and gives a loud shrill note. Used largely in temple processions.

Tiruchinnam or *Sri Churnam* (*P. III, fig.* 8) consists of a pair of thin brass trumpets each about 2½ feet in length. Used in temples on the occasion of services and also by the Dāsaris and mendicants. The two narrow ends are held in the mouth and blown at the same time.

Kombu or *Horn* (*Pl. III, fig.* 9) called " Sringa " in the north. It is about four to six feet in length and consists of 4 or 5 brass tubes fitting into one another as shown in the illustration. The end pieces are connected by a rod or cord to give stability. It gives a very shrill note and is used in temple processions, receptions, and public amusements. Used in martial music and also for signals. It is even now the custom for village watchmen to blow the horn at sunset and at stated hours of the night. When high officials or persons of dignity come to a village, the horn blowers stand at the village gate and blow their horns with tremendous effort by way of welcoming them. Madras and Nepal are noted for their horns. In Nepal we come across snake-shaped horns and horns with a serpent's or tiger's head as orifice.

S-shaped horns (*Pl. III, figs.* 10, 11, 12).—Nos. 10 and 11 consist of four pieces, while No. 12 consists of six pieces. These S-shaped horns, like the Kombu, which is crescent-shaped are used in temple processions, receptions and public amusements.

Two big S-shaped horns of silver formerly in the establishment of the Tanjore Rajahs are even now to be seen in the Tanjore Palace.

(*c*) *Folk Instruments.*

1. Shepherd's flute.
2. Reed Dulcimer.
3. Nedunguzhal.
4. Magudi.

Shepherd's Flute (ஆயர் குழல்) (*Pl. III, fig.* 2).—Compared with the concert flute, this is shorter in length, but the cross-section is greater. The thickness of the wall of the bamboo is also greater. There is a mouth-piece resembling that of a clarionet and the number of finger-holes is eight. The tone is low and sweet and has a charming influence upon the sheep when played by the shepherds in the valleys by the side of hills. This is the common pastoral instrument of the shepherds and cowherds.

Reed Dulcimer (*Pl. III, fig.* 3).—A series of short hollow reeds closed at one end are fastened together as shown in the illustration. The reeds are of graduated length and the open ends are on the same level. Each reed gives a different note. This is based on the principle of the organ. The shorter reeds give notes of higher pitch and vice versa.

The instrument is held in the right or the left hand in such a way that the longer reeds are to the left and the shorter ones towards the right and played.

Nedunguzhal (*Pl. III, fig.* 4).—This is the long flute of the rustic folk pierced with a few finger-holes. It gives a low sound.

Magudi (*Pl. III, fig.* 5).—Called as *Punji* in the north. Used mostly by snake-charmers and jugglers and sometimes by mendicants. The instrument consists of a bottle gourd, into the bulbous end of which are inserted two canes—their interior ends being cut so as to form reeds. One pipe gives the drone note while the other is pierced with finger-holes for playing the music. Wind is blown through the hole pierced on the top of the neck of the gourd. The parts of the instrument are fastened together by means of black wax. Sometimes the instrument is blown by the nostrils and on this account it is called as *Nāsa Jantra.*

The magudi is graduated to the Hanumatodi scale (a scale of komal or flat notes) and the *Punnāgavarāli raga,* a derivative of this scale is played. This raga allures the serpents and makes them come out of the dark holes underneath and dance before the player. The instrument has a characteristic tone.

C.—Percussion Instruments.

(*a*) *Concert Drums.*

1. Mridangam.
2. *a* and *b*. Tabla and Bāya.
3. Dōlak.
4. Tavil.
5. Kanjira.

Mridangam (*Plate V, fig.* 1).—This is the classical drum of India and is met with in all South Indian music parties, *Katha Kalakshepams and †Bhajanas. The name literally means "Clay-body" and most probably the shell was originally of clay. Brahma is said to have invented it to serve as an accompaniment to the dance of Mahādeva after his victory over Tripurāsura. Ganesa was the first to play the instrument. This is the drum for chamber music and is an indispensable accompaniment to both vocal and instrumental music in South India. Mridangam solos given in concerts are a real treat to the ear. Drum-playing is a great art in India and the like of this is not to be seen in other countries. It requires years of practice to attain proficiency in the mridangam.

The body is bored out of a single block of wood. Jack-wood or red-wood (*Alangium decapitalum*) is used. The shape of the body might be likened to two bottomless flower-pots joined at their rims. Skins fastened to leather hoops and tightened by leather braces are stretched over the two heads. Small cylindrical pieces of wood (not seen in

* *Katha Kālakshepam.* - A religious discourse given to the accompaniment of music. The principal performer is called the "*Bhagavatar*" A Katha kalakshepam party consists of the bhagavatar, a person for playing the drone, a mridangam player and a time-keeper.

† *Bhajana* is a peculiar religious institution in India. Here groups of people gather together for the purpose of congregational worship on festival days and other sacred days. Songs in praise of God are sung on such occasions, to the accompaniment of sweet instrumental music.

the illustration—but see fig. 2-*a* Tabla) plāced between the shell and the braces help in adjusting the pitch of the instrument.

The right-head of the mridangam (seen clearly in the figure) consists of three concentric layers of skin, the innermost being concealed from view. The outer ring is called *Mittu* (மீட்டு தோல்) and the inner ring *Chapu* (சாபு தோல்). Calf's skin is used for the outer ring and the sheep skin for the inner ring. In the centre of the right-head is a permanent fixture of black paste. This circular layer, called variously as Sōru (சோறு), Karanai (கரணை), and Marundu (மருந்து) in Tamil is a composition of Manganese dust, boiled rice and tamarind juice or a composition of fine iron filings and boiled rice. This black paste is applied on the inner skin (சாபு தோல்) in small grains and finally rubbed over for hardening with the polished surface of a hard stone. The paste is thickest in the centre and thins out towards the edges. It is this black ring that gives the fine characteristic tone to the mridangam.

The left-head consists of two rings only—the outer one is of buffalo skin and the inner one of sheep skin. At the commencement of a concert, a paste of soojee and water or of boiled rice, water and ashes is temporarily fixed on to the centre of this head and this paste is scraped off at the close of the concert. The quantity of this paste is so adjusted that the note given by the left-head is exactly an octave below the note given by the right-head.

As a rule the diameter of the left-head is greater than that of the right-head by about half an inch. The right-head diameter varies from 6¼″ to 7″ and the left-head diameter from 6¾″ to 7½″. The right-head is tuned to the tonic note of the performer.

On the two hoops of the instrument, there are sixteen interspaces for the leather braces (of buffalo skin) to pass through. By downward and upward strokes with a small hammer on the hoop at the appropriate points, the pitch of the instrument is increased or decreased.

The instrument is played with the two hands, wrists and finger tips. Jati exercises are first learnt vocally and practised on a dummy instrument and then only the practice on the mridangam commences with the mastering of preliminary beats and strokes. Even as a clever musician is able to show his creative skill in the field of music, so also an expert mridangam player is able to display his powers of creative skill by new permutations and combinations of jatis.

Pakhawaj, the corresponding instrument in Northern India, has smaller heads.

Tabla and Bāya (*Pl. V, figs. 2-a and b*).—These two instruments take the place of the mridangam in Northern and Central India. They are used only in theatrical music and in the Hindustani music parties in South India. The tabla's head corresponds to the right head of the mridangam and the bāya's head to the left of the same. The shell of these one-faced drums is either of wood, metal or clay. Sometimes the bāya also is provided with a permanent fixture of the black paste—referred to under mridangam. In such cases, the black ring instead of being in the centre as in the tabla and mridangam will be found near the edge. Some bāyas are provided with tuning blocks.

The mridangam and the tabla are the two concert drums wherein there is provision for altering the pitch. They lend themselves admirably to all kinds of drumming finesse.

Dōlak (*Pl. V, fig.* 3).—This is a simpler drum found all over India. The shell is hollowed out of a solid block of wood. The braces are of twine or of thick cotton thread and pass through circular rings of metal near the middle of the shell. These rings aid in tuning. The two heads are plain. The instrument is played with the hand and a stick.

Tavil (*Pl. V, fig.* 4).—The drum used in the nagaswaram band or peria melam. It consists of a cylindrical shell hollowed out of a solid block of wood. The skins on the two sides are stretched over hempen hoops fastened to the shell and strained by means of leather thongs interlaced. A band of leather passing round the shell along the middle over the braces serves to tighten the instrument up to the desired pitch. The thickness of the wall of the shell varies from ⅛ to 1/10 of an inch. The right head is played by the right hand, wrist and fingers and the left head is struck with a stick held in the left hand. This is the drum used in out-door music.

Kanjira (*Pl. V, fig.* 5).—This is the cheap tambourine used in concerts and bhajana parties and used also by the mendicants. Over one side of a circular wooden frame, 8 or 9 inches in diameter and about 3 or 4 inches deep, a piece of skin usually of varanus is stretched. The frame is provided with three or four slits containing pieces of metal strung together (seen on the right side). In addition, small clusters of ankle-bells (seen in the middle) are suspended from hooks fixed on the frame. These together give a pleasing jingling accompaniment as the instrument is played.

(*b*) *Temple Drums.*

1. Nagārā.
2. Damārum.
3. Uḍukkai.
4. Davaṇḍai.
5. Pambai.
6. Sūryapirai and Chandrapirai.

Nagārā (*Pl. VI, fig.* 1).—This is the large hemispherical kettle-drum covered with hide and used in temples. The shell is of copper, brass or sheet-iron rivetted together. The diameter of the head is about 2½ to 3 feet. The skin is strained upon hoops of metal and stretched by leather thongs passing round the under side of the shell. The instrument is placed on a two-wheeled carriage, and drawn by a person who follows the procession of the Deity. The player sits on the carriage and beats the drum with two curved sticks. Sometimes a decorated elephant carries this drum on its back, and goes in front of the procession.

Bigger varieties of this instrument, known as *Bhēri* and *Dundubhi* were used in battle. The Indian epics make mention of these martial drums. The battle-drum was regarded with great veneration and capture of this drum meant the defeat of the army.

Damārum (*Pl. VI, fig.* 2).—The pair of conical drums placed on a bullock and seen preceding every temple procession. The shell is of wood and the braces are of leather. It is played with two sticks, one curved and the other straight.

Udukkai (*Pl. VI, fig.* 3).—Called also as *Tudi* (துடி) and *Idai Surungu parai* (இடை சுருங்கு பறை) on account of its shape. This is the hour-glass shaped drum laced with twine. A thin parchment is strained over the two faces. Right along the middle, passing over the twine threads is a thick tape, the squeeze of which tightens the braces, resulting in the sharpening of the tone. The effect of this is really interesting. The shell is of brass, wood or clay. The instrument is held in the left hand and played by the fingers of the right hand. Used in all Māriamman temples and in the temples of village deities.

The sacred *Damaru*, the attribute of Siva is of the same shape as the Udukkai but has a knot at the end of a string wound round the middle, which strikes the two faces at the centre alternately when the instrument is rattled. Nataraja is represented with the damaru in one of his four hands. The *budubuduke* of the gipsies and jugglers is a miniature damaru.

Davandai (தவண்டை) (*Pl. VI, fig.* 4) is a bigger udukkai. The shell is of wood and is laced with thick twine. The skin on the two sides is thicker. It is played with a stick. This is also used in Mariamman temples and in some old shrines.

Pambai (பம்பை) (*Pl. VI, fig.* 5).—A pair of cylindrical drums each about one foot in length. The outer surface is coloured and painted with flowers. It is played with two sticks, shown below in the figure. As in the dolak (*Pl. V, fig.* 3) the twine braces pass through metal rings which help in tuning.

Sūryapirai (of the shape of the sun) and *Chandrapirai* (of the shape of the moon) (*Pl. VI, fig.* 6) are two interesting percussion instruments used in Māriamman temples and other temples of village deities. A thin parchment is strained over iron rings of the two shapes. The rings are connected to a handle with an extended arm. The two instruments are tied on the foreheads of two persons and played with a stick. In the illustration, the one to the left is the Sūryapirai and the other on the right is the Chandrapirai.

(*c*) *Other Drums.*

Dāsari Thappattai (*Pl. IV, fig.* 8).—The small tambourine used by the Pandārams and Dāsaris along with the Semakkalam and the conch. A piece of calf's skin is strained over a circular metallic frame sloping on both the sides. It is held in position between the stomach and the elbow of the left arm and played by the right hand fingers, the left hand proper, holding and striking the Semakkalam.

(*d*) *Gongs, Cymbals and Castanets.*

1. Semakkalam.
2. Jālra.
3. Brahmatālam.
4. Tālam.
5. Chipla.
6. Kartāl.

Semakkalam (*Pl. IV, fig.* 7).—This is the bell-metal gong used by the Dāsaris, mendicants, Pandārams and the Panichavan caste people. Called also Sōmangalam

from its moon-shape and is used in temples also. A round stick (shown at the top of the figure) of the calotropis plant is used to strike the gong. In the month of Margazhi (மார்கழி)—the second half of December and the first half of January, it is a common sight to see the Pandārams in the streets of South India going about asking alms, singing Tamil songs, and keeping time with the Semakkalam. This instrument is also seen in the Tirupati Pilgrims' Procession.

Jālra (*Pl. VII, fig.* 1).—The pair of metallic cymbals used for keeping time in music. They are of brass or bell-metal and are circular flat discs. The two discs are usually connected by a cord or cotton thread passing round their centres. The *Jalra is* principally used in Harikathā Kālakshēpams and Bhajana Parties. Mendicants also use it to keep time to their music. Even with such a simple instrument, there are skilled performers who are able to play all the difficult combinations of jatis and cope up successfully with even the expert mridangam performers.

Pandharpur Jālras are famous for their fine tonal quality and are in great demand.

Brahmatālam (*Pl. VII, fig.* 2) is the pair of cymbals larger than the ordinary variety and used in temple services. Called also *Brihattālam.*

Tālam (*Pl. VII, fig.* 3) is the pair of small basin cymbals, the sweet tinkling of which goes very pleasingly with the soft music in a dance party, Harikatha or Tevāra Bhajana. This is heavier than the Jalra and generally only the edges are struck. The two cymbals are not connected; but at the back of each is a tassel of silk or wood serving as a handle. The tālam used in the Nagaswaram band resembles the ordinary Jalra but is thicker.

Chupla (*Pl. VII, fig.* 4).—Two pieces of hard wood (blackwood or rose-wood) about six inches in length, flat on one side and rounded on the other are provided with slits into which are inserted metal pieces. Some ankle-bells are also suspended from hooks fixed at the two ends. The metal pieces and the ankle-bells together give a jingling accompaniment to the beats of the castanets. A brass ring is fixed on the back of each wooden piece for the fingers to pass through.

Kartāl (*Pl. VII, fig.* 5).—Two circular wooden castanets, used by mendicants. The instrument is held in either hand and the faces are struck against each other.

D.—MISCELLANEOUS INSTRUMENTS.

1. Jalatarangam.
2. Silambu (சிலம்பு)
3. Salangai (சலங்கை).
4. Pujāri Kai Chilambu (பூஜாரி கைச்சிலம்பு).
5. Ghatam (கடம்).
6. Moursing.

Jalatarangam (*Pl. VIII, fig.* 1) meaning "water-waves" consists of 18 porcelain cups of distinct sonorousness arranged in a semi-circle before the performer. The

empty cups when struck give notes of different pitch. But as a rule water is poured into the cups and played. Water is poured into the cups for three purposes :—

(1) To increase and decrease the pitch with ease, by removal or addition of water.

(2) To give a sustained note.

(3) To enable the gamakas to be played by the sticks coming into contact with the water meniscus.

The tuning of the various cups generally takes a long time and the cups are so arranged that the pitch is in the increasing order from left to right. The cups are struck with two thin bamboo sticks. The Jalatarangam is a solo instrument. It is also used in orchestra.

Silambu (*Pl. VIII, fig.* 2).—Hollow circular rings of silver with metal pieces inside worn on the legs. This along with the ankle-bells gives a sweet tinkling sound as the dancer sways to and fro ; called *Karchilambu* (காற்சிலம்பு), i.e., silambu worn on the legs.

Salangai or *Ankle-bells* (*Pl. VIII, fig.* 3).—Called also *Gejjam*, *Gejjai* and *Kinkini*. This is between a musical instrument and an ornament. A thick cotton thread is passed through the rings of the ankle-bells and knots on this thread between these rings keep the ankle-bells in position. This is tied round the ankles of all dancers (male and female), bhāgavatars and some actors. Amongst the professional dancing girls, the gejjai is held very sacred for it is the symbol of their profession. Once a woman of this class is decorated with the gejjai, which is always a solemn ceremony, she cannot give up her profession. Even in bhajanas, before the commencement of the Divya Nama Sankirtana, the bhagavatar is decorated with the gejjai by one of the senior devotees present. A special song is sung on this occasion. The untying of the gejjai marks the conclusion of the bhajana.

Ankle-bells and silambu are tied round the legs of cows on festival occasions like the pongal. Every post-runner in India has a few bells attached to his little spear, and their tinkling may be heard for a very long distance as the runner passes along the village.

Pujāri Kaichilambu (பூசாரி கைச்சிலம்பு) (*Pl. VIII, fig.* 4).—Inside an elliptical hollow metallic ring of about an inch, in thickness, are inserted thin metal pieces. Two such rings, one in each hand, are held between the fingers and moved to and fro so as to serve as a rhythmic accompaniment. Very commonly used in Mariamman temples and in the temples of village deities.

Ghatam (*Pl. VIII, fig.* 5).—The mud pot is one of the ancient time-keeping instruments. The mouth of the ghatam is open and somewhat narrow. When closed with a parchment, it becomes the pot-drum. Strong, durable and resonant pots for this purpose are made at Panruti and Manamadura in South India. The pot is played with the two hands, wrists and the ten fingers and nails. The mouth is pressed against the stomach so that when strokes are given, the air inside is set in vibration and gives a deep tone A very high degree of speed in playing the different combinations of jatis is possible on this instrument. Finger-strokes are given at the neck, centre and the bottom of the outer surface, and the resulting tones in these positions also vary. Unlike other percussion instruments the ghatam is not kept in the same position, during playing. Sometimes the mouth faces upwards and sometimes away from the performer.

Moursing (*Pl. VIII, fig.* 6) (Jew's harp).—An elastic thin iron strip called the tongue is fixed to a circular iron ring as shown in the illustration. This strip projects a little beyond the ring at one end and at the other end is slightly curled. It passes right along the centre of the ring and between the two arms. The instrument is held in the left hand and the fork portion is held in the mouth. The curled end of the tongue is plucked by the forefinger of the right hand. The cavity of the mouth acts as a resonator. A skilled performer is able to play all the jati combinations with accuracy. When played along with the mridangam, the combined effect is delightful and pleasing.

2. TRIBAL INSTRUMENTS.

A.—Of the West Coast.

1. Villadi Vādyam.
2. Pulluvan Kuṭam.
3. Villukoṭtu.
4. Vīna Kunju.

Villadivādyam (*Pl. IX, fig.* 1).—A lacquered bow seven or eight feet long is fitted with a cord of strong leather. A few bells are suspended from the bow as shown in the illustration. The middle of the bow rests on a pot. Four or five persons sit on the floor before the bow and strike the cord in turn with short sticks made for the purpose. These sticks are shown on the side of the pot. Lads, who undergo a course of training in this art, are employed in the temples as singers and are paid handsomely.

Pulluvankuṭam (*Pl. IX, fig.* 2) consists of a mud-pot with a circular opening at the bottom. A vellum is stretched over the narrow mouth of the pot. A twine tied to the centre of the vellum on the outer surface passes through the pot along the hole at the bottom and passing through a slit in a wooden beam ends in a metal cup. The pot and the metal cup are kept in position as shown in the illustration. The twine is struck with a stick, the pot serving as a resonator. The twine is easily tightened by pulling the pot slightly away from the direction of the metal cup. This is used by the Pulluvans of Malabar, a tribe of Serpent-worshippers.

Villukottu (*Pl. IX, fig.* 3).—The spathe of arecanut or cocoanut palm is taken and small slits are made at the two ends. A bamboo stick with knobs at the two ends is inserted between the slits and the whole thing appears like a bow. This bamboo stick which is held rigidly between the two ends is struck with another smaller stick, shown in the middle of the instrument.

Vina Kunju (*Pl. IX, fig.* 4).—A thin skin is strained over a shallow circular resonator. A finger-board of the shape shown in the illustration is attached to the resonator. A single string of fibre or twine, tied at the attachment passes over a bridge on the belly and over the narrow finger-board and is tied to the peg at the neck. It is played with a crude bow, shown separately on the right. Used by the Pulluvans on the West Coast.

B.—Of the Kotas.

1. Kombu.
2. Drum.
3. Tambaṭṭam.

The Kotas are a tribe of musicians, artisans and farmers of the Nilgiris.

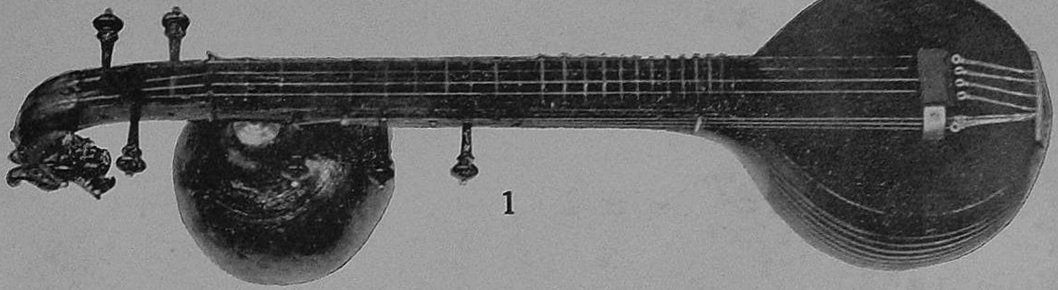
Kombu (*Pl. IX, fig.* 5).—For description see P. 17.

Drum (*Pl. IX, fig.* 6) with a cylindrical wooden shell resembling the *uḍal* used in temple rituals. Skin is stretched over both the faces and tightened by leather braces which are clearly seen in the illustration. The instrument is played with two sticks shown on the top.

Tambaṭṭam (*Pl. IX, fig.* 7).--Here, the skin is strained over a circular frame by means of a network of thin leather thongs. This network is concealed from view in the illustration. It is played with two small sticks.

PLATE I.

1. Vīna (Tanjore model).
2. Gotu Vādyam.
3. Swarabat.
4. Big Sitar.
5. Small Sitar.



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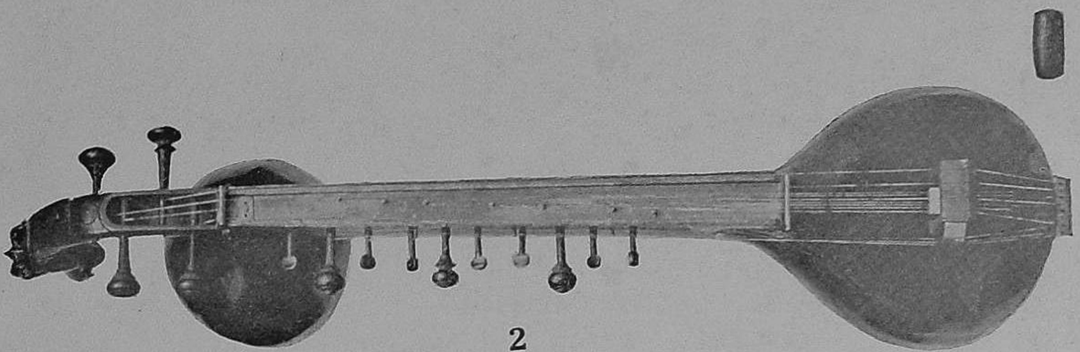

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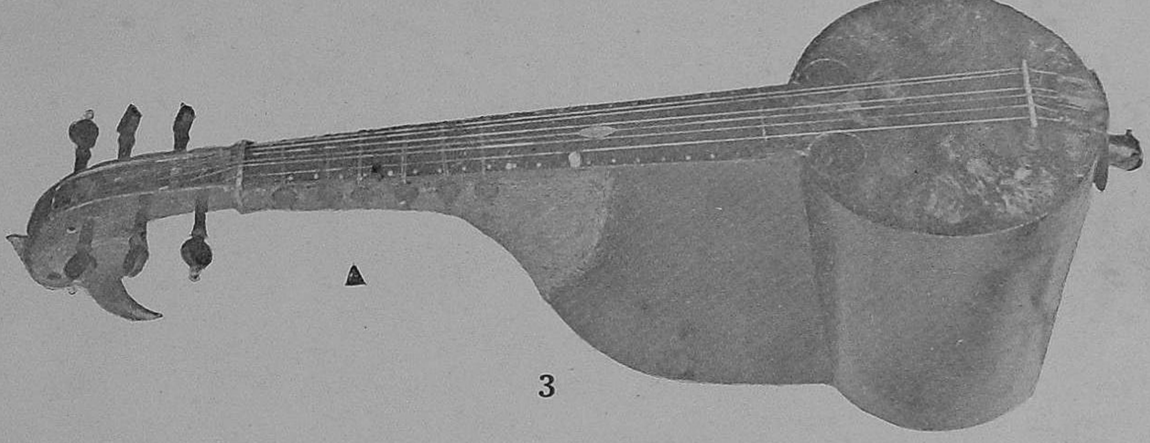

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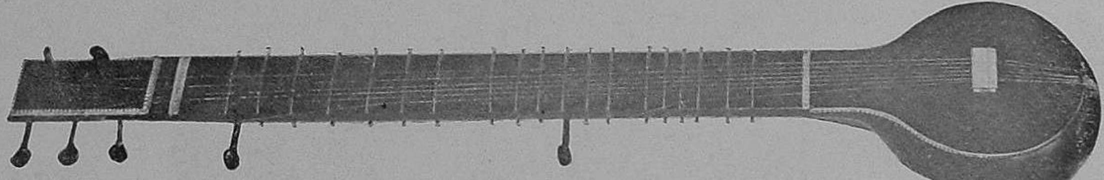

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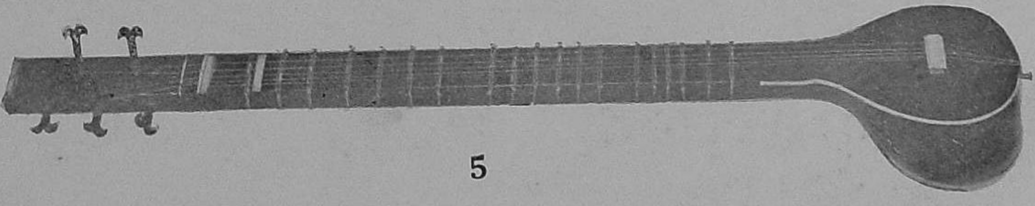

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PLATE II.

1. Tambura (Tanjore model).
2. Tuntina.
3. Tambura with a wooden shell and rest.
4. Ektar.
5. Bālasaraswati.
6. Sārangi.

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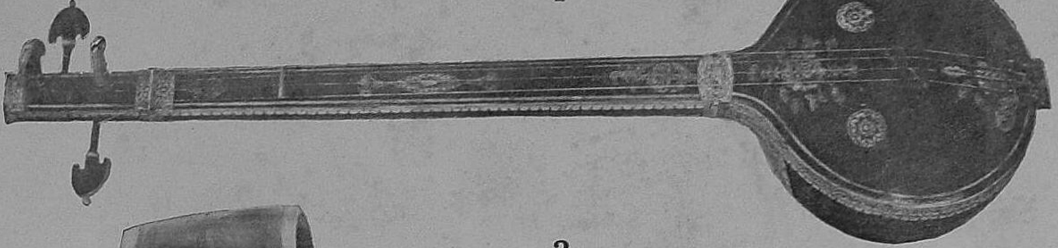

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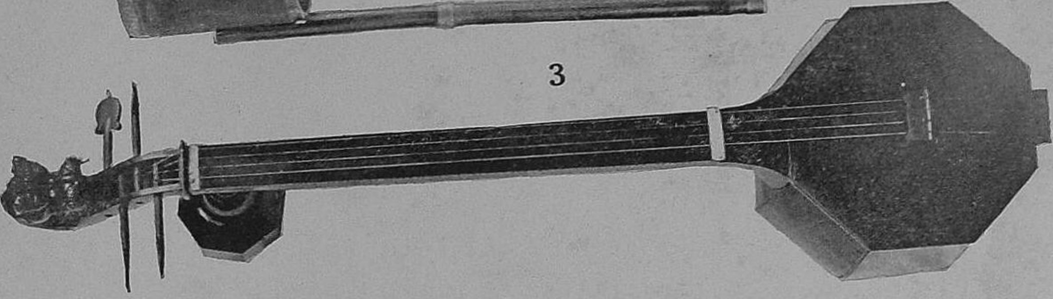

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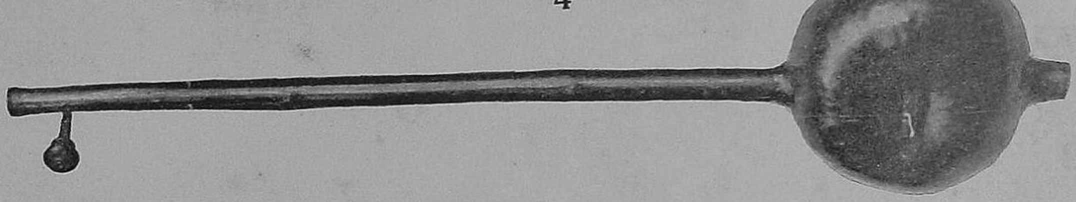

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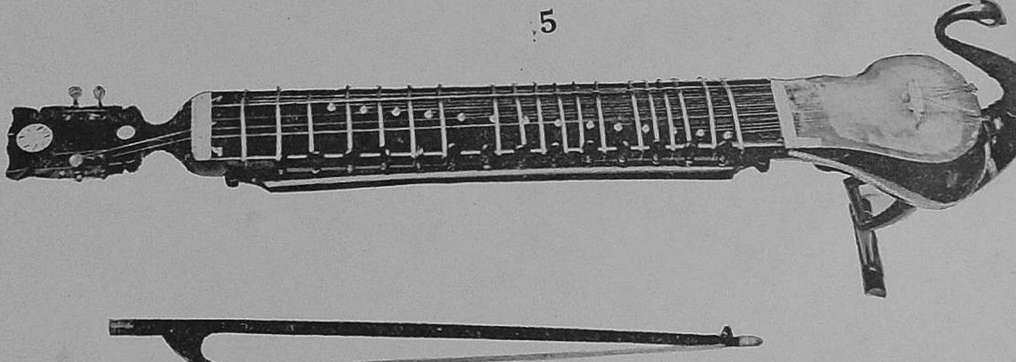

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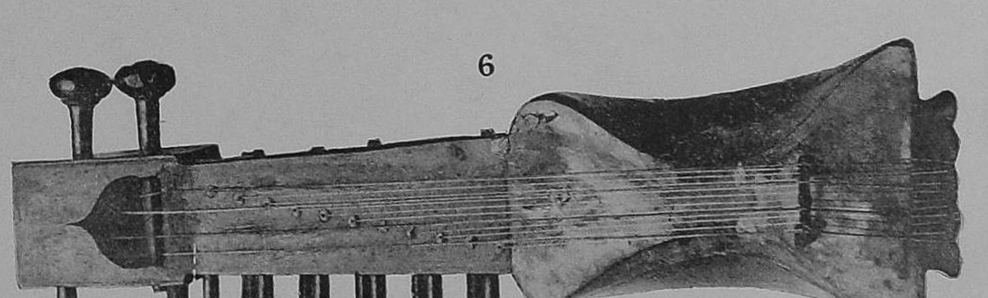

PLATE III.

1. Concert Flute.
2. Shepherd's Flute.
3. Reed Dulcimer.
4. Nedunguzhal.
5. Magudi.
6. Bhūri.
7. Ekkālam.
8. Tiruchinnam.
9. Kombu.

10. 11, 12. S-shaped horns.

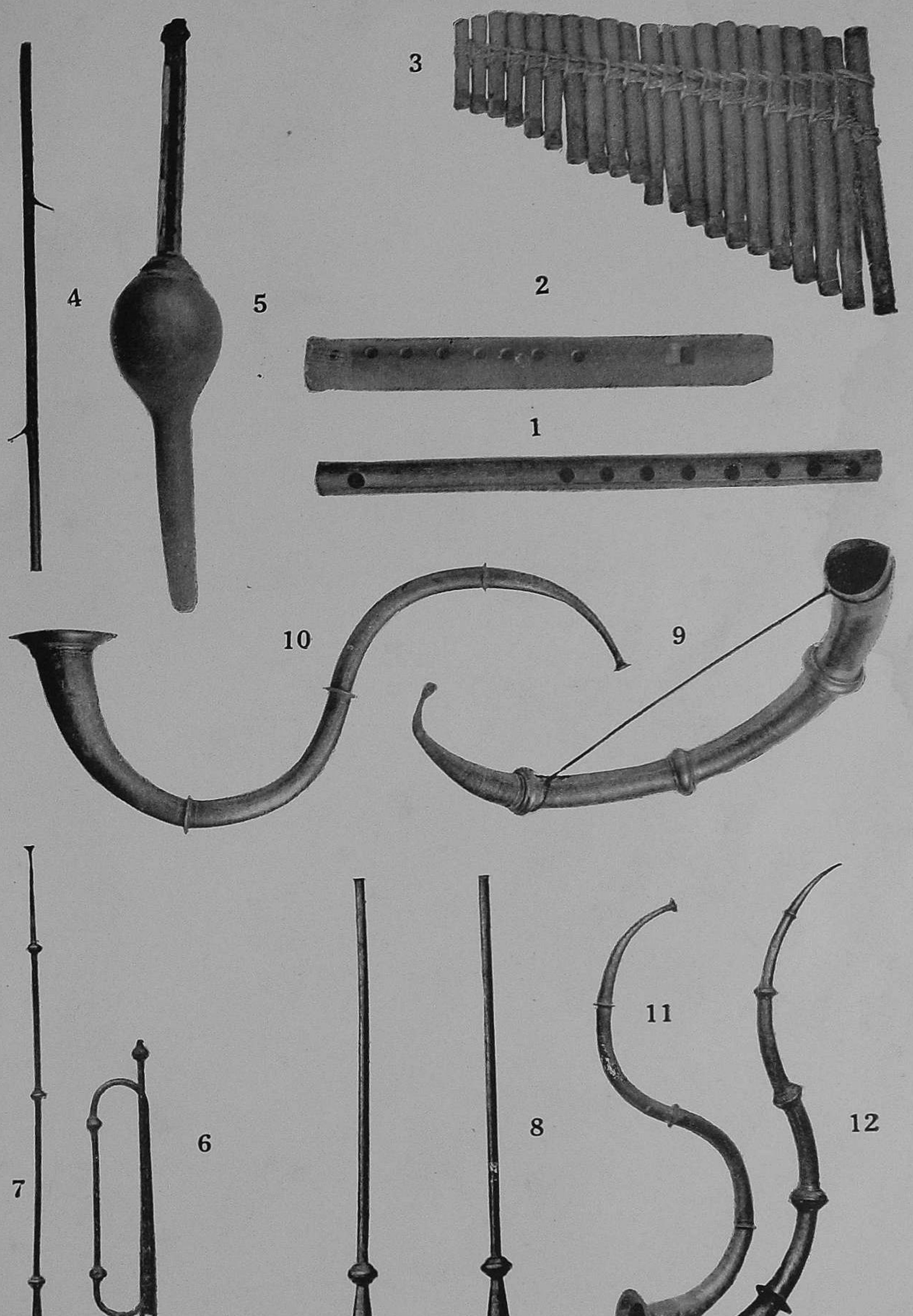
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PLATE IV.

1 Nāgaswaram.
2. Nāgaswaram (another variety).
3. Ottu.
4. Mukhavīna.
5. Sanāi.
6. Kinnari.
7. Semakkalam.
8. Dāsari Tappaṭṭai.

PLATE IV.

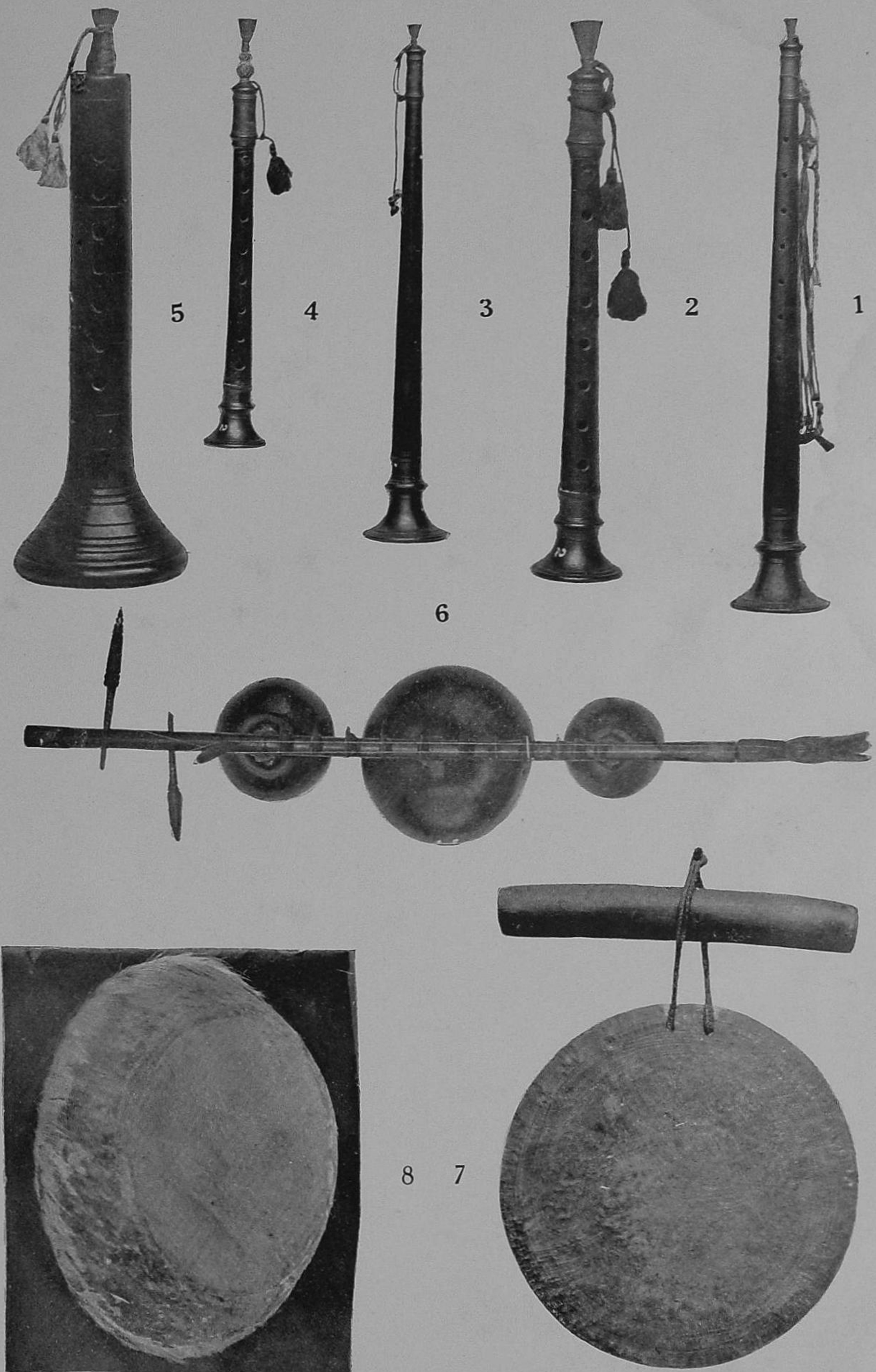
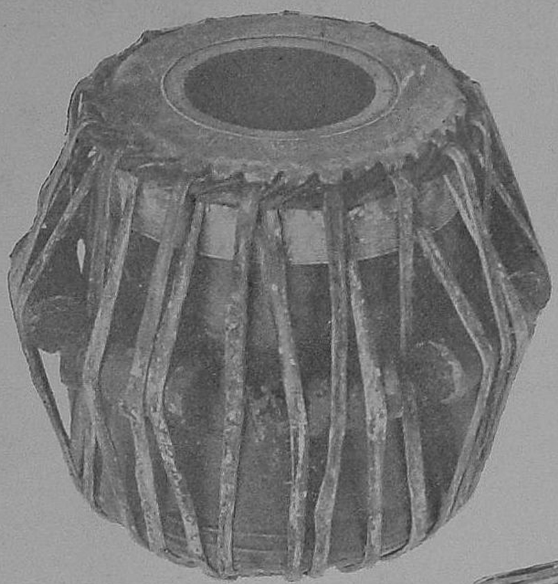


PLATE V.

1. Mridangam.
2-*a* and *b*. Tabla and Bāya.
3. Dōlak.
4. Tavil.
5. Kanjira.



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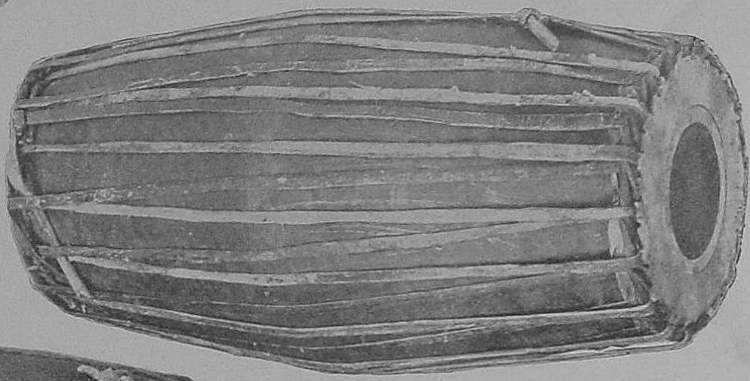

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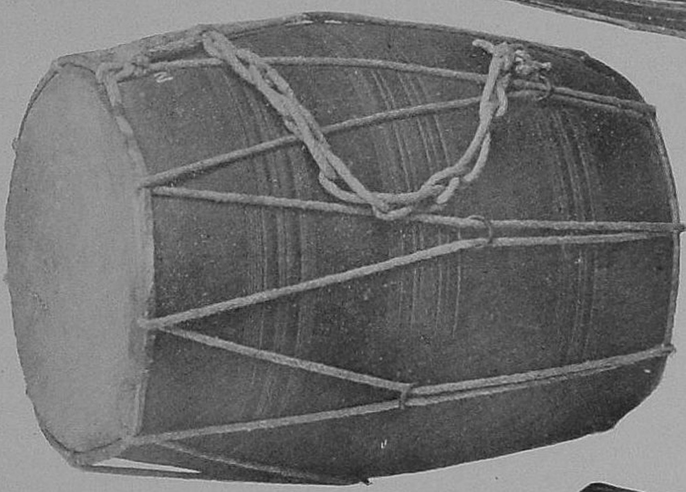

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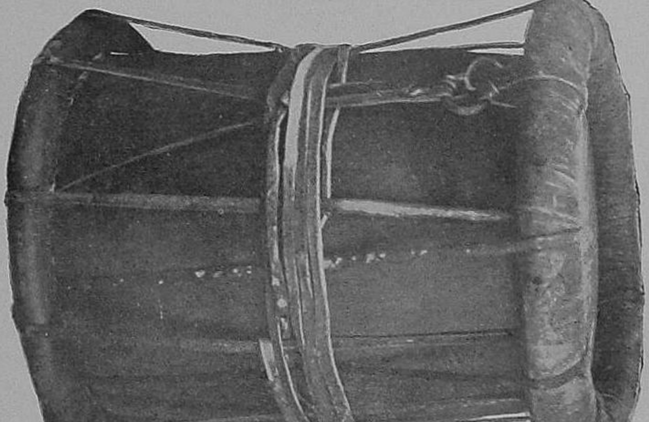

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PLATE VI.

1. Nagārā.
2. Damārum.
3. Udukkai (metal shell).
4. Davanḍai.
5. Pambai.
6. Sūryapirai and Chandrapirai.
7. Conch.

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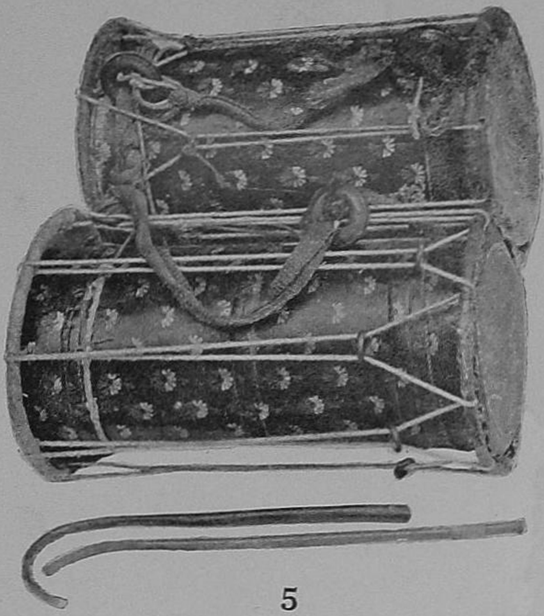

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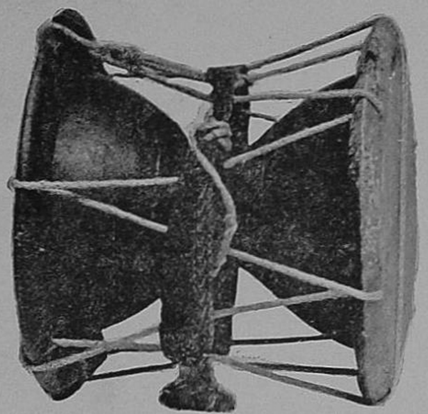

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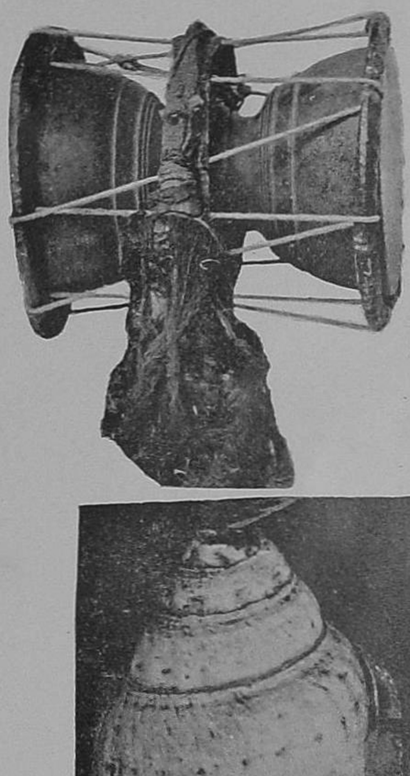

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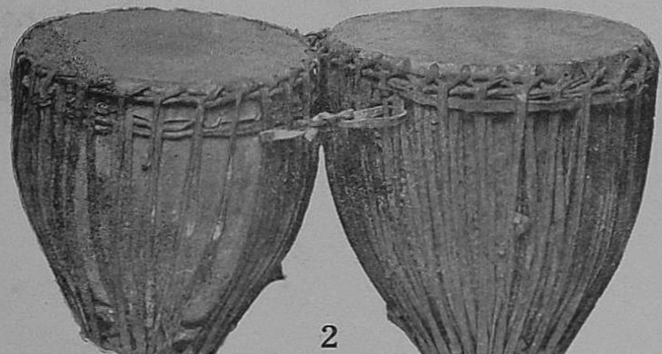

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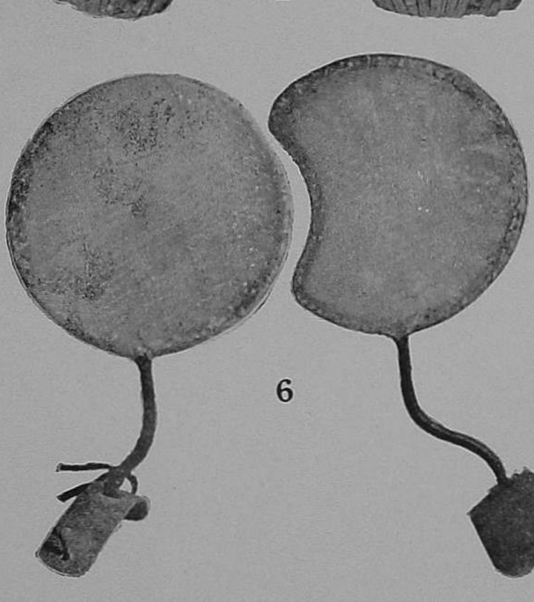

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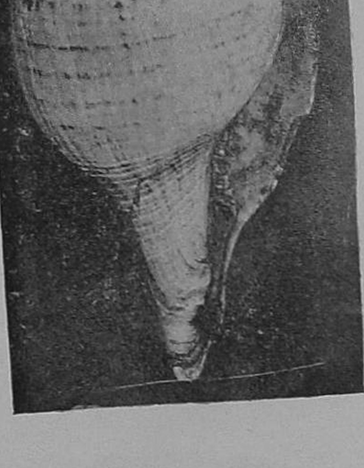

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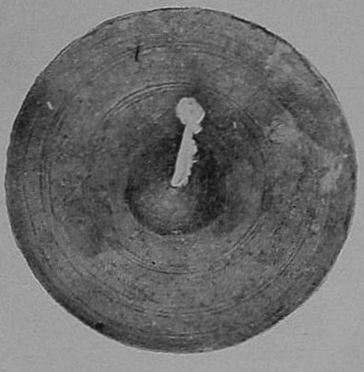
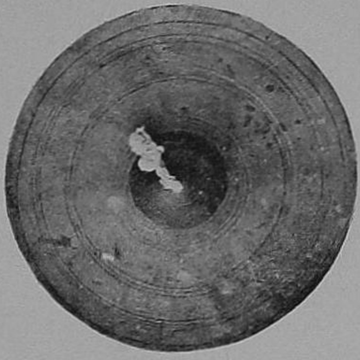
PLATE VII.

1. Jālra.
2. Brahma Tālam.
3. Tālam.
4. Chipla.
5. Kartāl.





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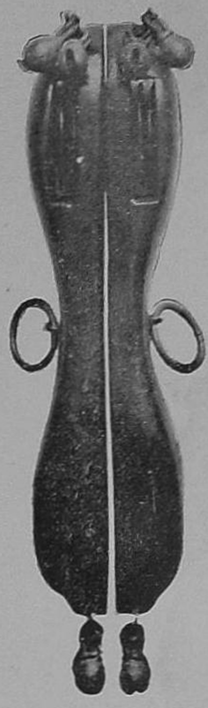

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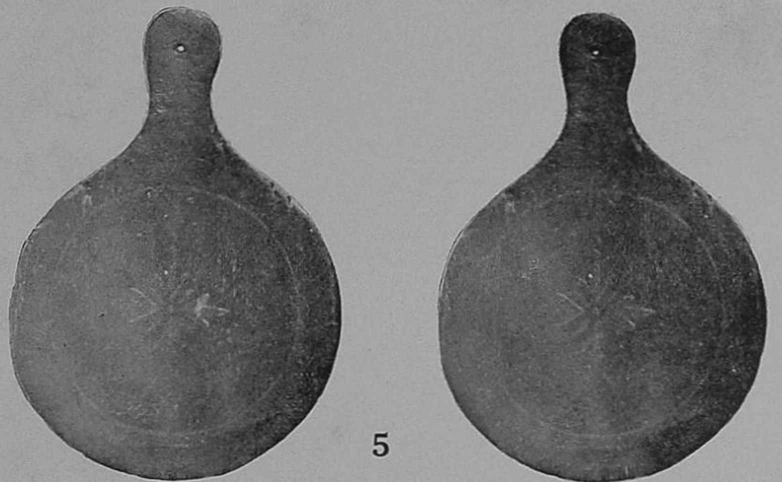

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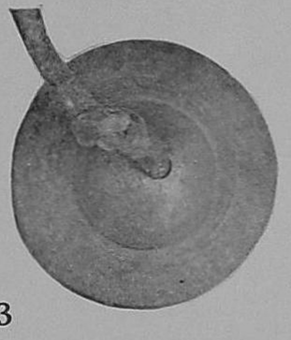

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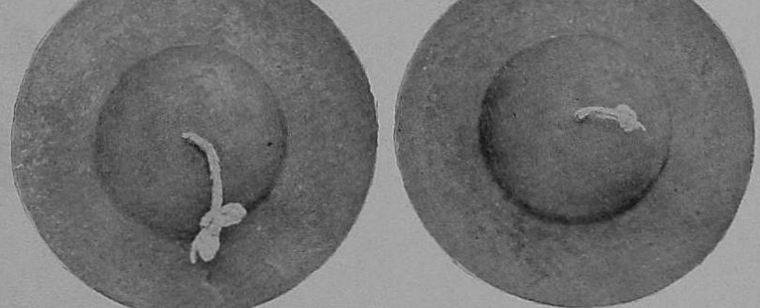

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PLATE VIII.

1. Jalatarangam.
2. Silambu.
3. Gejjai (ankle bells).
4. Pujari Kaichilambu.
5. Ghatam.
6. Moursing.

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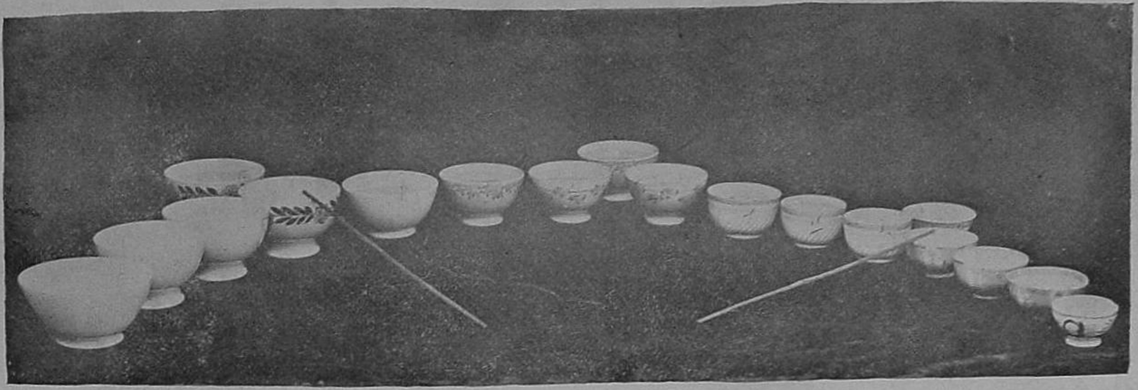

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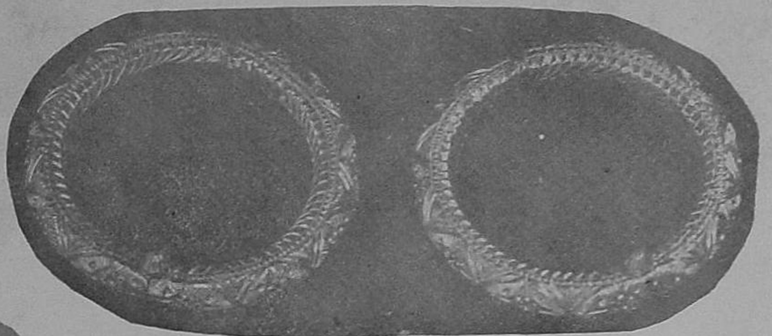

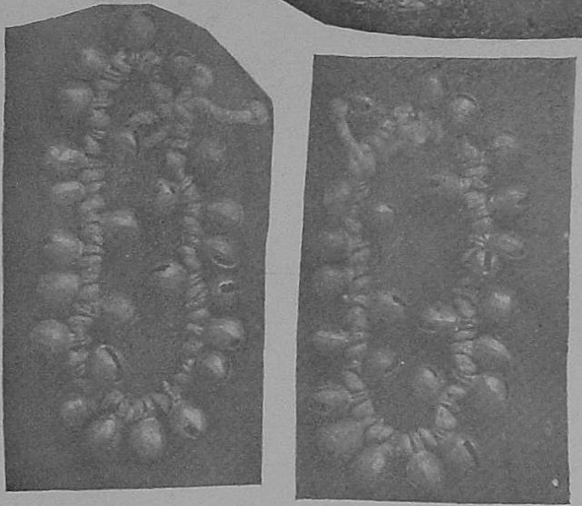
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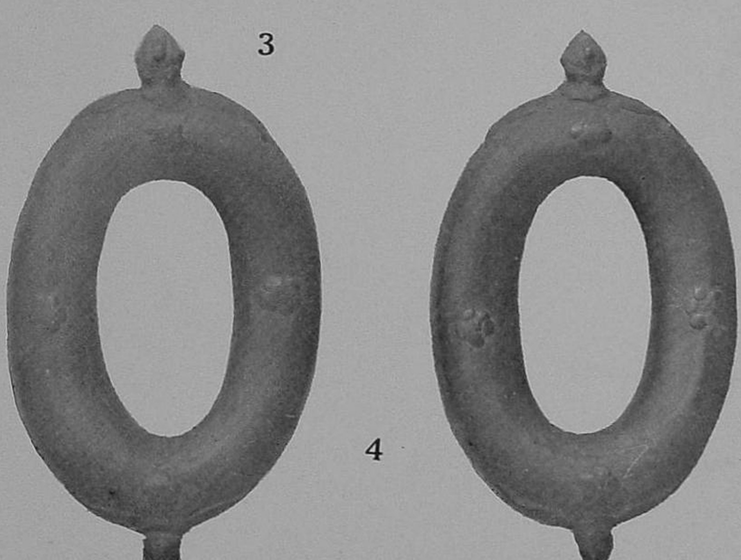
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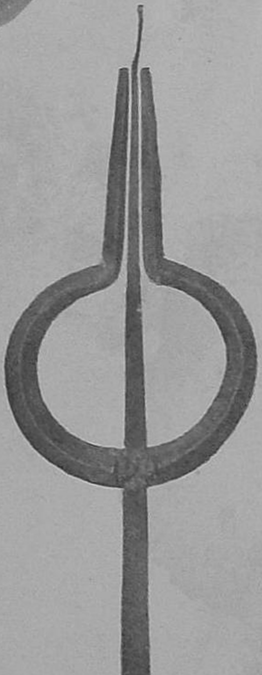
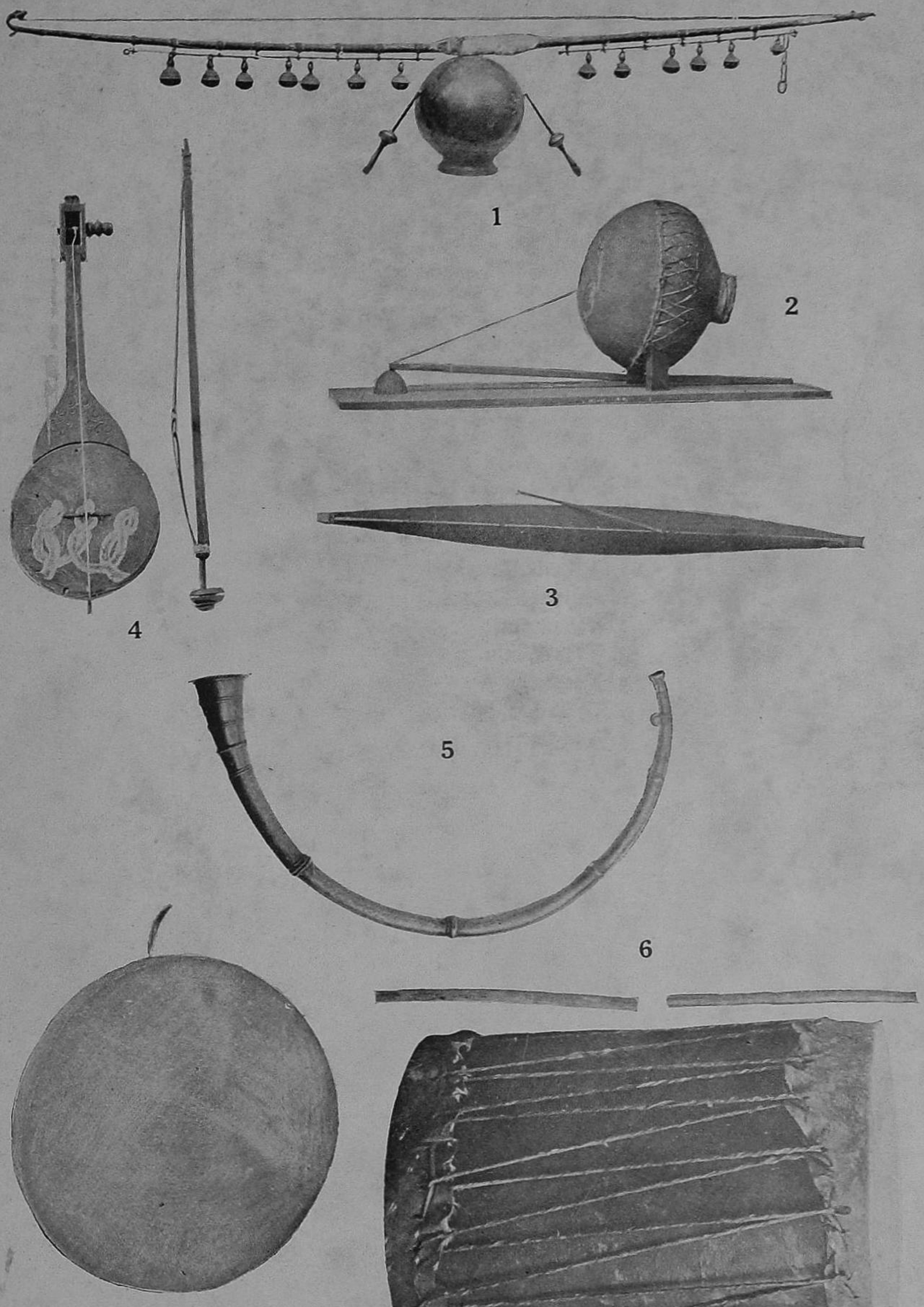


PLATE IX.

1. Villadi Vādyam.
2. Pulluvan Kuṭam.
3. Villukottu.
4. Vīna Kunju.
5. Kombu.
6. Cylindrical Drum.
7. Tambaṭṭam.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